

1/2/18

"Remember no one can make you feel inferior without your consent." -Eleanor Roosevelt

HW: "Quadratic Inequalities" Practice #1-4

Test 3 on Friday 1/12

Quarter Test Thursday 1/18

AIM: How do we solve Quadratic Inequalities?

Warm-up:

Solve for x:  $4^{2x-3} = \left(\frac{1}{2}\right)^{3x}$

$$\left(2\right)^{2x-3} = \left(2\right)^{-3x}$$

$$\begin{array}{r} 4x - 6 = -3x \\ -4x \quad -4x \\ \hline \end{array}$$

$$\begin{array}{r} -6 = -7x \\ \frac{-6}{-7} = \frac{-7x}{-7} \end{array}$$

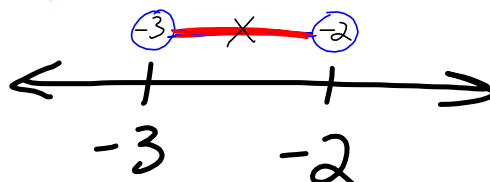
$$\frac{6}{7} = x$$

Write the solution set of each inequality in set builder, and interval notation.

1)  $x^2 + 5x + 6 \leq 0$

$(x+3)(x+2)$   
 $x = -3 \quad x = -2$

Less than open circles



Set builder:  $\{x \mid -3 < x < -2\}$

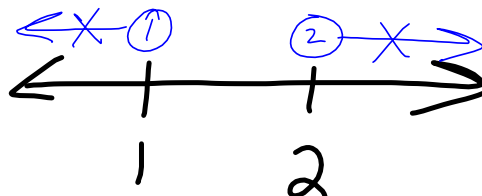
Interval:  $(-3, -2)$

2)  $x^2 - 3x + 2 > 0$

$(x-2)(x-1)$

$x = 2 \quad x = 1$

GOLI  
 open circles



SB:  $\{x \mid x < 1 \text{ or } 2 < x\}$


Int:  $(-\infty, 1) \cup (2, \infty)$

G - Greater Than

O - Outside

L - Less than

I - Inside

 When the  $x^2$  term is positive

(not included)

$<$  or  $>$

[included]

$\leq$  or  $\geq$

$$3) x^2 > 12 - x$$

$$\begin{array}{r} +x \quad -12 + x \\ -12 \\ \hline \end{array}$$

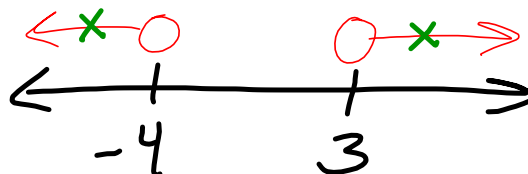
$$x^2 + x - 12 > 0$$

$$(x+4)(x-3)$$

$$x = -4 \quad x = 3$$

critical  
Values

GOLI  
open  
circles



$$\underline{SB}: \{x \mid x < -4 \text{ or } 3 < x\}$$

$$\underline{Int}: (-\infty, -4) \cup (3, \infty)$$

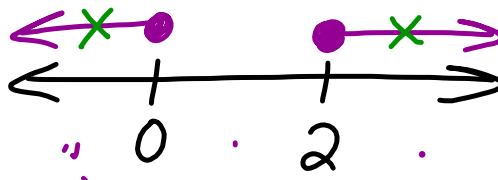
$$4) x^2 \geq 2x$$

$$\begin{array}{r} -2x \quad -2x \\ \hline \end{array}$$

$$x^2 - 2x \geq 0$$

$$\begin{array}{c} x(x-2) \\ 0 \quad 2 \end{array}$$

GOLI  
closed  
circles



$$\underline{SB}: \{x \mid x \leq 0 \text{ or } 2 \leq x\}$$

$$\underline{Int}: (-\infty, 0] \cup [2, \infty)$$

Let's list the steps necessary to solve a quadratic inequality:

- 1) Get everything to one side  
(Keep  $x^2$  positive)
- 2) Factor
- 3) Find the critical values  
(Set each factor equal to 0 and solve)
- 4) Make the number line using the critical values. (Use GOLI)
- 5) Express the solution with Setbuilder and/or interval notation.

HW Check:

1)  $2x + 24 - 2x$